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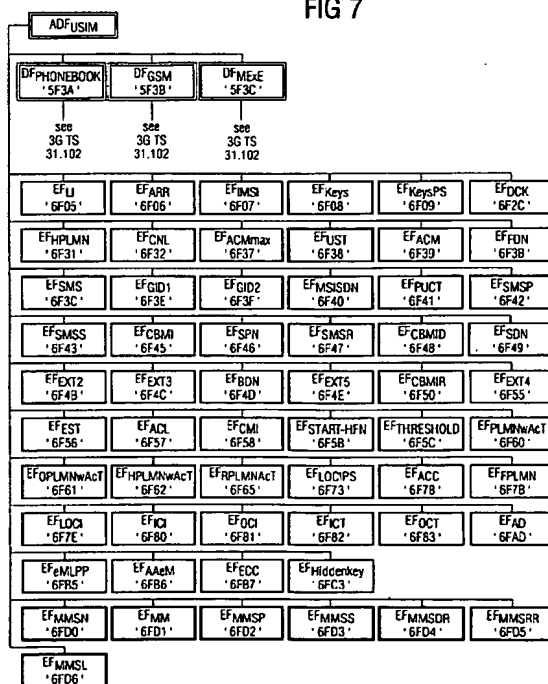
(54) Method and medium for storing and accessing MMS (Multimedia Messaging Service) information

(57) Method for storing MMS (Multimedia Messaging Service)-related information, related method for accessing MMS-related information, related storage medium, related apparatus and related software programs

The invention relates to method for storing MMS (Multimedia Messaging Service)-related information, wherein said information is stored on at least one storage medium connected to a mobile communication ap-

paratus which supports MMS services or a device connected to such a mobile communication apparatus, said at least one storage medium being disconnectable from said apparatus or said device. Furthermore, the invention concerns a related method for accessing MMS-related information by an apparatus adapted to process said MMS-related information, a related storage medium, a related apparatus and related software programs.

FIG 7



EP 1 255 416 A1

Description

[0001] Method for storing MMS (Multimedia Messaging Service)-related information, related method for accessing MMS-related information, related storage medium, related apparatus and related software programs

[0002] The invention relates to a method for storing MMS (Multimedia Messaging Service)-related information.

[0003] Furthermore, the invention concerns a related method for accessing MMS-related information by an apparatus adapted to process said MMS-related information, a related storage medium, a related apparatus and related software programs.

[0004] Currently a new messaging service, the so called MMS (Multimedia Messaging Service) is being standardized. Contrary to SMS (Short Message Service) MMS messages can contain multimedia elements like for example text, image, audio or video. E.g. MMS is planned to be installed in mobile communication systems of the 3rd generation such as UMTS (Universal Mobile Telecommunication Service).

[0005] MMS as shown in Figure 1 is a known peer-to-peer messaging service between two MMS User Agents (UA_A, UA_B) which are each connected to an MMS Relay/Server (RS_1, RS_2) each comprising an MMS Relay (R) and an MMS Server (S) both being connected via an interface called MM2. Both MMS Relay/Server (RS_1, RS_2) are connected via an interface called MM4. Furthermore, each MMS Relay/Server (RS_1, RS_2) can be connected to one or more external servers (ES_1, ..., ES_N) via interfaces called MM3 as well as MMS User Databases (UD) via an interface called MM6 and a Home Location Register via an interface called MM5. The User Agents (UA_A, UA_B) reside on a mobile phone, e.g. a UMTS-UA (User Equipment) or a GSM-MS (Mobile Station), or on an external device, e.g. a notebook/laptop, connected to a mobile phone. It is an application layer function that provides the user with the ability to view, compose and handle the Multimedia Messages (MMs), e.g. submitting, receiving, delivering of MMs. The MMS Relay/Server is a network entity responsible for storage and handling of incoming and outgoing messages and for the transfer of the message between different messaging systems.

[0006] MMS has several MMS-related information which is necessary for using MMS as messaging service. Important MMS-related information are for example: the MMS notification, the MMS delivery report, the MMS read reply report, MMS service parameters, the Multimedia Message itself, etc.

[0007] A user's MMS-related information is only available on a single terminal/device. If a user changes his terminal all MMS-related information is lost. If e.g. a user changes his terminal before downloading an MM he has been notified of this new MM is lost. He can not download it from a terminal different from the one he used when he was notified.

[0008] It is the goal of the present invention to allow users to handle MMS services with more flexibility.

[0009] Concerning the above mentioned method for storing MMS-related information this goal is accomplished via the features of independent claim 1. Concerning the above mentioned method for accessing MMS-related information this goal is accomplished via the features of independent claim 2. Concerning the related storage medium this goal is accomplished via the features of independent claim 24. Concerning the related apparatus this goal is accomplished via the features of independent claim 34. Concerning the related software programs this goal is accomplished via the features of independent claims 37 and 38, respectively.

[0010] The present invention proposes to store MMS-related information or parts of MMS-related information on media different from the user's terminal, especially

- Storage on a SIM (Subscriber Identity Module) or a USIM (UMTS Subscriber Identity Module) on the UICC (Universal Integrated Circuit Card).
- Storage on a WIM (Wireless application protocol Identity Module) on the UICC.
- Storage on a smart card which is not one of the above, especially an MMC (Multimedia Card).

It is also proposed to allow a user to have a combination of these storage possibilities. Such a combination can be a SIM and a USIM, or a USIM and a MMC, for example. Likewise, more than two storage mediums can form such a combination.

[0011] Furthermore, this invention identifies

- the information that is useful to be stored on such a repository, and
- proposes mechanisms how to achieve the storage of MMS-related information and how to access stored MMS-related information on a smart card, in particular on a SIM, a USIM on a UICC, a WIM or a MMC.

[0012] The invention's advantage lies in a much more sophisticated user experience of the MMS service. The present invention allows a user of the MMS service to have consistent access to his MMS-related information independent of whatever terminal/device he uses at a certain point of time. For example, the user may be notified about an MM (Multimedia Message) coming in but has no time to view or listen to the MM. He then may take out the MM stored on the storage medium and plug it into a computer to view or listen to the MM. If the MM contains e.g. a song the user might

listen to it on a music player (adapted to read the format of the song). The user also may extract the MM from another mobile communication apparatus than the one he had in use when he was notified of the MM. For originating and sending an MM the user may first compose the MM on a terminal of a mobile communication apparatus or a computer or any suitable apparatus and store the MM on a storage medium. He then can remove the storage medium from this apparatus and send it later from another suitable apparatus, said storage medium then connected to the latter apparatus.

[0013] Therefore, the invention proposes to provide storage possibilities for MMS-related information, preferably on the SIM or on the USIM on the UICC or on any other medium other than the user's terminal/mobile phone in this moment. The invention also proposes respective apparatus which store and/or allow access to such MMS-related information. Such an apparatus is e.g. a mobile communication apparatus, especially a mobile phone (which may include other functionalities, e.g. an organizer). Other embodiments are constituted by external devices, e.g. by a laptop, a notebook or an organizer which are connectable to such a mobile communication apparatus for storing the MMS-related information on said storage medium. The connection between the mobile communication apparatus and the external device may be realized by a cable, by infrared technology or by any other way of communication.

[0014] The storage medium according to the invention may also be employed by external apparatus according to the invention which may be designed to process the MMS-related information or parts thereof. This can be for example a music player adapted to read out an acoustical MM which has been received by a mobile phone and stored on said storage medium. The storage medium then can be removed from the mobile phone and put into the music player to play the MM. Here, there is no need for a direct connection between the mobile phone and the music player. Another example for an apparatus according to the invention is e.g. a video player which may read out a video-MM from the storage medium. All the apparatus for processing MMs (composing and/or displaying) may also be incorporated into a mobile communication apparatus.

[0015] MMS has several MMS-related information which is necessary for using MMS as messaging service. Important MMS-related information is for example: the MMS notification, the MMS delivery report, the MMS read reply report, MMS service parameters, the Multimedia Message itself, etc. These are some of the MMS-related information which might be stored on the storage medium.

[0016] Up to now it only has been known to store information which is related to SMS (like a short message itself, short message parameters, short message status report, etc.) on SIM-cards. It is known for mobile communication systems of the 3rd generation such as UMTS that the SMS-related information shall be stored on the USIM (the logical functionality) of the UICC (the physical card). In general, the above mentioned smart cards are plugged into a mobile phone and enable a user to use the mobile communication service he has subscribed to. Moreover, user preferences and settings as well as user's personal information can be stored on such smart cards.

[0017] For the storage of several information including the SMS-related information the memory of the SIM-card is organized in a known hierarchical file structure shown in Figure 2. There are three file types, namely a master file, dedicated files and elementary files. These files may be either administrative or application specific. The operating system handles the access to the data stored in different files. In case of SMS the SMS related information is stored in several elementary files. In Figure 3 the known storage of SMS related information on a USIM is shown. Four elementary files on the USIM are dedicated to SMS-related information. These are EF_{SMS} for the storage of short messages, EF_{SMSS} for SMS status information, EF_{SMSR} for SMS reports and EF_{SMSP} where SMS parameters are stored. In a very similar manner SMS-related information is stored on the USIM/ UICC.

[0018] The invention will be discussed more thoroughly with respect to the drawings. The drawings show:

Fig. 1 an MMS reference architecture according to the state of the art;

Fig. 2 organization of memory on a SIM according to the state of the art;

Fig. 3 storage of SMS-related information on a USIM according to the state of the art;

Fig. 4 an example of MMS transaction flows according to the state of the art;

Fig. 5 an example of an elementary file (EF_{MMS});

Fig. 6 the parameter indicators of the file according to Fig. 5, and

Fig. 7 storage of MMS-related information on a USIM according to one embodiment of the invention.

[0019] In order to describe the MMS-related information that is referred to throughout this document, the MMS service is roughly explained. Figure 4 shows a known example of transaction flows of sending an MM from one User Agent

(O-UA) to another User Agent (R-UA). The originator MMS User Agent (O-UA) would send an MM by submitting it to the originator MMS Relay/Server (O-RS) using the message MM1_send.REQ (MM1_SQ). The originator MMS Relay/Server acknowledges the submission with message MM1_send.RES (MM1_SR). The MM will be routed forward by the originator MMS Relay/Server (O-RS) using message MM4_forward.REQ (MM4_FQ) to the recipient MMS Relay/Server (R-RS). The recipient MMS Relay/Server (R-RS) acknowledges this with message MM4_forward.RES (MM4_FR). After this the recipient MMS Relay/Server (R-RS) sends a notification MM1_notification.REQ (MM1_NQ) to the recipient MMS User Agent (R-UA), which acknowledges with message MM1_notification.RES (MM1_NR). With this notification the recipient MMS Relay/Server (R-RS) informs the recipient MMS User Agent (R-UA) about a new MM.

[0020] An example of an MMS notification can be as follows:

```
X-Mms-Message-Type: m-send-request
X-Mms-Transaction-ID: 10
X-Mms-MMS-Version: 1.0
From: markus.trauberg@sal.siemens.de
Subject: A multimedia message
X-Mms-Message-Class: Personal
X-Mms-Message-Size: 52000
X-Mms-Expiry: 36000
X-Mms-Content-Location: http://siemens.de/sal/mms-id
```

[0021] In hexadecimal code after binary encoding according to WAP-209-MMSEncapsulation (WAP-209-MMSEncapsulation, Version 17):

0C	80	17	31	30	0D	20	09	20	10	6D	61	72	6B	75	73	2E	74	72	61
75	62	65	72	67	40	73	61	6C	2E	63	69	65	6D	65	6E	73	2E	64	65
00	15	41	20	6D	75	6C	74	69	6D	65	64	69	61	20	6D	65	73	73	61
67	65	00	0A	80	0E	CB	20	08	04	81	02	8C	A0	03	68	74	74	70	3A
2F	2F	73	69	65	6D	65	6E	73	2E	64	65	2F	73	61	6C	2F	6D	6D	73
2D	69	64																	

Table 1: Example of an MMS notification in hexadecimal code after binary encoding.

[0022] To retrieve the MM, the recipient MMS User Agent (R-UA) requests this MM from the recipient MMS Relay/Server (R-RS). This recipient MMS Relay/Server response with message MM1_retrieve.REQ (MM1_RQ). In a response to this request the recipient MMS Relay/Server (R-RS) delivers the MM to the recipient MMS User Agent with message MM1_retrieve.RES (MM1_RR). The recipient User Agent (R-UA) acknowledges the successful reception of the MM by sending a message MM1_acknowledge.REQ (MM1_AQ) to the recipient MMS Relay/Server (R-RS). The recipient MMS Relay/Server (R-RS) may create a delivery report and send it with message MM4_delivery_report.REQ (MM4_DRQ) to the originator MMS Relay/Server (O-RS). The originator MMS Relay/Server conveys this delivery report to the originator User Agent (O-UA) with message MM1_delivery_report (MM1_DRQ). In addition, e.g. after rendering the MM to the user the recipient User Agent (R-UA) may send a read-reply report with message MM1_read_reply_recipient.REQ (MM1_RRQ_R) to the recipient MMS Relay/Server (R-RS). The recipient MMS Relay/Server (R-RS) routes the read-reply report with message MM4_read_reply_report.REQ (MM4_RRQ) forward to the originator MMS Relay/Server (O-RS) which conveys it further to the originator MMS User Agent with message MM1_read_reply_originator.REQ (MM1_RRQ_O).

[0023] According to one preferred embodiment of the present invention MMS-related information can be stored on one or several smart cards. Plugged into a mobile phone these smart cards enable a user to use the MMS service he has subscribed to. User preferences for the MMS service and settings as well as the user's personal information can be stored on such smart cards.

[0024] One preferred possibility according to this invention is storing and/or accessing the MMS-related information on a general smart card (i.e. other than WIM, SIM or USIM on an UICC) which can be plugged into a terminal. Such

a smart card is preferably a multimedia card (MMC). The advantage of this is that the data is available to a user in a consistent manner independent of the terminal he uses. Another advantage is that, in general, an MMC offers much more storage capacities than a WIM, SIM or a USIM/UICC. An MMC allows e.g. even for the storage of several entire Multimedia Messages (which can exceed many kilobytes, even megabytes of data each).

[0025] Another preferred embodiment of the invention, which already has been mentioned above, is the storage on the SIM or on the USIM of the UICC or on a combination of storage on the SIM/USIM on the UICC and the terminal. The MMS-related information can be stored in several files, e.g. elementary files (EFs), dedicated files (DFs) or master file (MF) on the SIM card or on the USIM application of a UICC card, which per definition can be plugged into a mobile phone (note, that the MMS-related information in EFs and/or DFs and/or the MF advantageously can also be stored/ accessed in other storage media according to the invention). The advantage of this proposal is that the information is available to a user in a consistent manner independent of the terminal he uses. Another advantage is that a SIM or a UICC is always available in every single GSM or UMTS phone. I.e., this preferred embodiment ensures that the file format used for the MMS information and the mechanisms to access this information are understood by every single MMS-capable GSM or UMTS phone - independent of the terminal's manufacturer - for the file formats and access conditions are standardized for the SIM and the USIM/UICC. This is the reason why this proposal is one preferred solution.

[0026] Storing of the MMS related data in several EFs preferably can be done in three different ways according to this invention. In the following the storage on the USIM on the UICC is described. Note, that the mechanisms for storing and accessing MMS-relevant information on a SIM, on a Multimedia Card or on any other type of smart card preferably are identical to the mechanisms on the USIM. The following three different cases will be discussed:

- I. Storage of MMS-related information in several (elementary) files.
- II. Storage of MMS-related information in one universal/generic (elementary) file.
- II. Storage of the MMS notification in the existing (elementary) file EF_{SMS}.

[0027] These different storage principles will now be discussed in more detail.

I. Storage of MMS-related Information In several files

[0028] The first preferred embodiment proposed for the storage of MMS-related information is the storage in several files. For every important MMS information it is proposed to have a separate elementary file. In this example seven new elementary files are described. These files are (the names are chosen only by way of example) :

a)	EF _{MMSN}	Elementary file for the MMS notification.
b)	EF _{MM}	Elementary file for the Multimedia Message.
c)	EF _{MMSS}	Elementary file for the MMS status.
d)	EF _{MMSP}	Elementary file for the MMS parameters.
e)	EF _{MMSDR}	Elementary file for the MMS delivery report.
f)	EF _{MMSRR}	Elementary file for the MMS read reply report.
g)	EF _{MMSL}	Elementary file for the MMS size limitations.

[0029] Furthermore, changes are proposed to the USIM service table (EF_{UST}) which allows the USIM to indicate available services.

a) EF_{MMSN} (MMS notification)

[0030] This EF preferably comprises information in accordance with 3G TS 23.140 (3GPP TS 23.140 V4.2.0 (Release 4), Multimedia Messaging Service (MMS); Functional description; stage 2) and WAP-209-MMSEncapsulation comprising MMS notifications (and associated parameters) which have been received by the UA from the MMS Relay/ Server. With an MMS notification the MMS Relay/Server informs the UA of a recipient user about the arrival of a new MM. In particular the notification contains the information where the user can find that MM for downloading it from the network. Based on this information the recipient is able to retrieve the MM from the MMS Relay/Server at a later point in time.

[0031] Moreover, in case the sender has requested to get feedback information on the status of delivery for that MM (delivery report) the notification may contain information about this request. Based on this information in the notification the recipient user may decide to allow or disallow the MMS Relay/Server to create such a delivery report.

[0032] The advantage of storing the MMS notification on the (U)SIM (or any other storage medium according to the

invention) is that the user has consistent access to received MMS notifications and their status independent of whatever terminal/device he uses at a certain point of time.

[0033] Table 2 shows the preferred structure of every single record (an entry) of said elementary file.

Identifier: '6FD0'	Structure: Linear fixed	Optional	
Record length: 1+A bytes	Update activity: low		
Access Conditions:			
READ	PIN		
UPDATE	PIN		
DEACTIVATE	ADM		
ACTIVATE	ADM		
Bytes	Description	M/O	Length
1	Status	M	1 byte
2 to A+1	MMS Notification	M	A bytes

Table 2: EF for MMS Notification

[0034] According to this invention this EF has the following preferred structure:

[0035] Assigned to every EF is an "identifier" which addresses a file in the USIM and is 2 bytes long. All the service and network related information have addresses beginning with '6F.'. Because of this, the address for this EF with MMS-related information is chosen to be an address beginning with '6F.'. The "structure" of the file means which file structure is used. The file can be transparent, linear fixed, linear variable or linear cyclic. In this case it is chosen to be linear for a sequence of records is needed and fixed. The size of every record (an entry in the elementary file) - which is "A+1" octets in the Table 2 - has to be the same.

[0036] Note: For most of the MMS-related information does not have a well-defined size, but the value of "A" would need to be predefined. Using linear fixed files means that the storage capacity of the elementary file can not be used the most efficient way. For notifications that are shorter than "A+1" octets still "A+1" octets would be reserved (but not used) while notifications that are longer than "A+1" octets would need to be cut off. A second proposal is thus to use a linear variable file structure for the EFs. In this case every record has a variable length, which saves storing capacity. From a technical point of view a linear variable file structure is thus preferred. However, both, SIM and USIM only support linear fixed file structures. Thus, this invention prefers the first solution. For records that are not completely filled with MMS-related data, subsequent octets following the MMS-related data shall be filled with 'FF'. This note applies also to all other elementary files further down!

[0037] The EF_{MMSN} can be optional or mandatory. In this case it is chosen to be "optional", because MMS will be an optional feature on 3G mobile phones. The next parameter is the "record length", which contains the total file length in bytes. The "update activity" can be low or high. In this file the update activity is low, because this EF preferably will not be updated as often as for example the keys on the USIM. The file has the following access conditions: For "READ" and "UPDATE" preferably "PIN" (Personal Identification Number) is used, while that are conditions which the user controls. For "DEACTIVATE" and "ACTIVATE" preferably "ADM" is used, because these access conditions are under control of the authority which created this file. I.e. the file can be read and updated by the user - to whom the SIM grants access by the use of a PIN - while it can only be activated and deactivated by the operator of the mobile network. Furthermore, Table 2 indicates which bytes are used for which parameter, a description of the data and the length of the data.

[0038] EFs described below will preferably have the same structure.

[0039] According to Table 2, the EF_{MMSN} preferably comprises one or more of the following data:

1. Status

[0040] Preferred contents of "Status": The status byte in the EF_{MMSN} contains information related to the MMS notification. These information can be for example:

- The MMS notification is received by the UA from the MMS Relay/Server, is stored in the EF_{MMSN} on the USIM (or another storage medium according to invention; without limitation the following explanation refers to an USIM), but has not been read by the user yet (i.e. MMS Notification to be read).

5 • The MMS notification received by the UA from the MMS Relay/Server, is stored in the EF_{MMSN} on the USIM and the notification has been read by the user.

10 • In the case that the MMS notification received by the UA from the MMS Relay/Server is stored in the EF_{MMSN} on the USIM and the notification has been read by the user there are some possibilities according to delivery report related information:

- A delivery report has not been requested by the sender of the MM which the notification refers to.
- A delivery report has been requested by the sender and in a response to this notification the recipient has permitted the MMS Relay/Server to create this delivery report.
- 15 • A delivery report has been requested by the sender and in a response to this notification the recipient has not permitted the MMS Relay/Server to create this delivery report.

20 • In the case that the MMS notification received by the UA from the MMS Relay/Server is stored in the EF_{MMSN} on the USIM and the notification is read by the user there are some possibilities according to MM retrieval related information:

- The MM retrieval has been requested by the recipient, but the MM is not (yet) retrieved.
- The MM has been retrieved from the MMS Relay/Server by the UA.

25 **[0041]** The status byte of the record can be used as a pattern in the SEARCH RECORD command. The SEARCH RECORD is a function on the interface between the terminal and the USIM which allows the terminal to search for a pattern in various USIM entries. The status preferably will be updated when the UA receives an MMS notification.

[0042] Preferred coding of "Status": The preferred coding of the status byte is depicted in Table 3 below.

- 30
- 1 denotes that the corresponding bit is set.
 - 0 means the corresponding bit is NOT set.
 - X indicates that the corresponding bit may be set or not (i.e. the interpretation of the status byte is independent of this bit's value).

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55

	b8	b7	b6	b5	b4	b3	b2	b1	
5									
			X	X	X	X	X	0	Free space
			X	X	X	X	X	1	Used space
10			X	X	X	X	0	1	MMS notification received by UA from MMS Relay/Server; notification to be read
15			X	X	X	X	1	1	MMS notification received by UA from MMS Relay/Server; notification read
20			X	X	X	0	1	1	Delivery report related information
			X	X	0	0	1	1	delivery report not requested.
25			X	1	1	0	1	1	delivery report requested and creation of delivery report allowed.
30			X	0	1	0	1	1	delivery report requested, but creation of delivery report not allowed.
			X	X	X	1	1	1	MM retrieval related information
35			X	X	0	1	1	1	MM retrieval requested but MM not (yet) retrieved
			X	X	1	1	1	1	MM retrieved from the MMS Relay/Server
40									Reserved for future use

Table 3: Preferred coding of the status byte.

[0043] When for example the notification, which has been described with respect to Figure 4, is sent from an originator MMS User Agent to a recipient User Agent,

- the MMS notification has been received by the recipient User Agent from the recipient MMS Relay/Server,
- has been read by the user,
- the creation of a delivery report has been requested by the originator MMS User Agent (and the recipient MMS User Agent has been informed about this request in the notification)
- and the creation of this delivery report has been allowed by the recipient User Agent,

the status byte will be "XXX1 1011", i.e. for example "0001 1011" in bit presentation, which is "1B" in hexadecimal presentation. The contents of the EFMMSN in hexadecimal presentation will thus be as follows:

1B	0C	80	17	31	30	0D	20	09	20	10	6D	61	72	6B	75	73	2E	74	72	61
75	62	65	72	67	40	73	61	6C	2E	63	69	65	6D	65	6E	73	2E	64	65	
00	15	41	20	6D	75	6C	74	69	6D	65	64	69	61	20	6D	65	73	73	61	
67	65	00	0A	80	0E	CB	20	08	04	81	02	8C	A0	03	68	74	74	70	3A	
2F	2F	73	69	65	6D	65	6E	73	2E	64	65	2F	73	61	6C	2F	6D	6D	73	
2D	69	64																		

Table 4: Example of an MMS notification.

[0044] The '1B' in this record corresponds to the status byte and the other part of this file is identical to the MMS notification as given in the chapter "state of the art" above.

2. MMS Notification

[0045] Preferred contents of "MMS Notification": The A bytes of MMS Notification contain especially the notification information about an MM as it has been received from the MMS Relay/Server.

b) EF_{MM} (Multimedia Message)

[0046] This EF preferably comprises information in accordance with 3G TS 23.140 and WAP-209-MMSEncapsulation comprising MMs (and preferably associated parameters) which have either been received by the UA from the MMS Relay/Server or are UA originated messages.

[0047] In UA originated messages the sender has the possibility to request feedback information on the status of delivery for that MM (delivery report) and/or feedback information on the status of handling/rendering that MM on the recipient's UA (read-reply report). After submitting a UA originated MM to the MMS Relay/Server the UA awaits this feedback information which has to be matched to this MM.

UA terminated messages are always retrieved based on information provided in a prior received notification. In case the sender of such a UA terminated MM has requested to get feedback information on the status of delivery for that MM (delivery report) the MM contains information about this request. Based on this information in the MM the recipient user may decide to allow or disallow the MMS Relay/Server to create such a delivery report. In case the sender of that MM has requested to get feedback information on the status of handling/rendering that MM on the recipient's UA (read-reply report) the MM contains information about this request. Based on this information in the MM the recipient user may decide to create and send out such a read-reply report.

[0048] The advantage of storing the MM on the (U)SIM or a WIM is that the user has consistent access to the MM and its status independent of whatever terminal/device he uses at a certain point of time.

[0049] Table 5 shows the preferred structure of every single record (an entry) of the elementary file.

Identifier: '6FD1'		Structure: Linear fixed		Optional
Record length: 1+B bytes			Update activity: low	
Access Conditions:				
READ		PIN		
UPDATE		PIN		
DEACTIVATE		ADM		
ACTIVATE		ADM		
Bytes	Description		M/O	Length
1	Status		M	1 byte
2 to B+1	MM		M	B bytes

Table 5: EF for MM.

[0050] According to Table 5, the EF_{MM} preferably comprises one or more of the following data:

1. Status

[0051] Preferred contents of "Status": The status byte of the record advantageously can be used as a pattern in the SEARCH RECORD command. The status preferably will be updated when the UA receives an MM or has originated an MM which is to be stored on a USIM (or a SIM, a WIM, a MMC or another storage medium according to the invention).

[0052] The status byte in the EF_{MM} contains information related to the MM. These information can indicate for example:

[0053] In case of UA terminated MM:

- The MM has been received by the UA from the MMS Relay/Server and is stored in the EF_{MM} on the USIM (or another storage medium according to invention; without limitation the following explanation refers to an USIM), but has not been read by the user yet (i.e. MM to be read).
- The MM has been received by the UA from the MMS Relay/Server, has been stored in the EF_{MM} on the USIM and the MM has been read by the user.
- In the case that the MM received by the UA from the MMS Relay/Server is stored in the EF_{MM} on the USIM and the notification has been read by the user there are some possibilities according to delivery report related information:
 - A delivery report has not been requested by the sender of the MM.
 - A delivery report has been requested by the sender and the recipient has permitted the MMS Relay/Server to create this delivery report.
 - A delivery report has been requested by the sender and the recipient has not permitted the MMS Relay/Server to create this delivery report.
- In the case that the MM received by the UA from the MMS Relay/Server is stored in the EF_{MM} on the USIM and the MM is read by the user there are some possibilities according to read-reply report related information:
 - A read-reply report for the MM has not been requested by the sender.
 - The read-reply report for the MM has been requested by the sender, but has not yet been created by the recipient.
 - The read-reply report has been requested for the MM and this read-reply report has been created by the recipient, but has not (yet) been sent out.
 - The read-reply report has been requested for the MM and this read-reply report has been created by the recipient and has been sent out.

[0054] In case of UA originated MM:

- An MM has been created by the user, but has not yet been submitted to the MMS Relay/Server.
- 5 • An MM has been created by the user and has been submitted to the MMS Relay/Server.
- In case that the MM has been submitted to the MMS Relay/Server there are the following possibilities according to the delivery report:
 - 10 • A delivery report has not been requested for the MM.
 - A delivery report has been requested for the MM, but it has not (yet) been received.
 - A delivery report has been requested for the MM and this delivery report has been received, but has not (yet) been stored in EF_{MMSDR}.
 - 15 • A delivery report has been requested for the MM and this delivery report has been received and is stored in EF_{MMSDR}.
- In case that the MM has been submitted to the MMS Relay/Server there are the following possibilities according to the read-reply report:
 - 20 • A read-reply has not been requested for the MM.
 - A read-reply report has been requested for the MM, but has not (yet) been received.
 - A read-reply report has been requested for the MM and this read-reply report has been received, but has not (yet) been stored in EF_{MMSRR}.
 - 25 • A read-reply report has been requested for the MM and this read-reply report has been received and is stored in EF_{MMSRR}.

[0055] Preferred coding of "Status":

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	b8	b7	b6	b5	b4	b3	b2	b1	
5									
			X	X	X	X	X	0	Free space
			X	X	X	X	X	1	Used space
10			X	X	X	X	0	1	MM received by UA from MMS
									Relay/Server
			X	X	X	0	0	1	MM to be read
			X	X	X	1	0	1	MM read
15			X	X	0	1	0	1	Delivery report related
									information
			0	0	0	1	0	1	Delivery report not requested
20									for the MM
			0	1	0	1	0	1	Delivery report requested for
									the MM but not allowed to be
25									created
			1	0	0	1	0	1	Delivery report requested for
									the MM and allowed to be
30									created
			1	1	0	1	0	1	Reserved for future use
			X	X	1	1	0	1	Read-Reply report related
									information
35			0	0	1	1	0	1	Read-Reply report not
									requested for the MM
			0	1	1	1	0	1	Read-Reply report requested
40									for the MM but not (yet)
									created
			1	0	1	1	0	1	Read-Reply report requested
45									for the MM, created, but not
									(yet) sent out
			1	1	1	1	0	1	Read-Reply report requested
50									for the MM, created and sent
									out
									Reserved for future

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	b8	B7	B6	b5	b4	b3	b2	b1	
5									
			X	X	X	X	1	1	UA originating MM
			X	X	X	0	1	1	MM to be submitted to the MMS
10									Relay/Server(draft MM stored on
									the USIM)
			X	X	X	1	1	1	MM submitted to the MMS
									Relay/Server
15			X	X	0	1	1	1	Delivery report related
									information
			0	0	0	1	1	1	Delivery report not requested
20									for the MM
			0	1	0	1	1	1	Delivery report requested for
									the MM but not (yet) received
25			1	0	0	1	1	1	Delivery report requested for
									the MM, received, but not
									stored in EF _{MMSDR}
			1	1	0	1	1	1	Delivery report requested for
30									the MM, received and stored
									in EF _{MMSDR}
			X	X	1	1	1	1	Read-Reply report related
35									information
			0	0	1	1	1	1	Read-Reply report not
									requested for the MM
40			0	1	1	1	1	1	Read-Reply report requested
									for the MM but not (yet)
									received
			1	0	1	1	1	1	Read-Reply report requested
45									for the MM, received, but not
									stored in EF _{MMSRR}
			1	1	1	1	1	1	Read-Reply report requested
50									for the MM, received and
									stored in EF _{MMSRR}
									Reserved for future use

Table 6: Preferred coding of the status byte.

2. MM

[0056] Preferred Contents of "MM": The MM contains the entire multimedia message including MM elements/ attachments.

[0057] Preferred coding of "MM": The MM is preferably coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

c) EF_{MMSS} (MMS status)

[0058] This EF preferably comprises status information relating to the multimedia message service. This file can be read by the UA in order to get information about the current memory capacity for the storage of MMS related information on the USIM (or any other storage medium according to the invention), like for example MMS notification, MM, MMS delivery report, MMS read reply report, etc. This ensures that the maximum memory capacity is not exceeded. This information may be used by the UA to inform the MMS Relay/Server about the current memory capacity on the USIM.

[0059] When for example a MMS notification is passed from the UA to the USIM, the USIM determines the available memory capacity by calculating the difference between the current memory capacity (which is known to the USIM) and the size of the incoming data.

[0060] Table 7 shows the structure of every single record (an entry) of the elementary file.

Identifier: '6FD2'	Structure: Transparent	Optional	
File size: C+D+E+F+G bytes	Update activity: low		
Access Conditions:			
READ	PIN		
UPDATE	PIN		
DEACTIVATE	ADM		
ACTIVATE	ADM		
Bytes	Description	M/O	Length
1 to C	Message-ID	M	C bytes
C+1 to C+D	MMS notification memory capacity	M	D bytes
C+D+1 to C+D+E	MM memory capacity	M	E bytes
C+D+E+1 to C+D+E+F	MMS delivery report memory capacity	M	F bytes
C+D+E+F+1 to C+D+E+F+G	MMS read reply report memory capacity	M	G bytes

Table 7: EF for MMS status.

[0061] According to Table 7, the EF_{MMSS} preferably comprises one or more of the following data:

1. Message-ID

[0062] Preferred contents of "Message-ID": The message-ID is a unique reference assigned to the MM.

[0063] Preferred coding of "Message-ID": The message-ID is coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

2. MMS notification memory capacity

[0064] Preferred contents of "MMS notification memory capacity": The MMS-notification memory capacity contains the available memory for MMS-notifications.

[0065] Preferred coding of "MMS notification memory capacity": The MMS-notification memory capacity is coded in bytes.

3. MM memory capacity

[0066] Preferred contents of "MM memory capacity": The MM memory capacity contains the available memory for MMs.

[0067] Preferred coding of "MM memory capacity": The MM memory capacity is coded in bytes.

4. MMS delivery report memory capacity

[0068] Preferred contents of "MMS delivery report memory capacity": The MMS delivery report memory capacity is the available memory for delivery reports.

[0069] Preferred coding of "MMS delivery report memory capacity": The MMS delivery report memory capacity is coded in bytes.

5. MMS read reply report memory capacity

[0070] Preferred contents of "MMS read-reply report memory capacity": The MMS read reply report memory capacity is the available memory for read reply reports.

[0071] Preferred coding of "MMS read-reply report memory capacity": The MMS read reply report memory capacity is coded in bytes.

d) EF_{MMSP} (MMS parameters)

[0072] This EF preferably comprises values for Multimedia Messaging Service parameters, which can be used by the UE (User equipment) for user assistance in preparation of mobile multimedia messages (e.g. default values for parameters that are often used) and/or which can be used by the MMS service provider to preconfigure the MMS service according to his particular needs. These Multimedia Messaging Service parameters are for example the originator address, the recipient address, the MMS Relay/Server address, the expiry time, the earliest time of delivery, the message class, the sender visibility request, the delivery report request, the read reply report request and the priority.

[0073] The advantage of storing these parameters on the USIM on the UICC (or any other storage medium according to the invention) is for example that several of these parameters will be common for MMs send by the subscriber, i.e. the user can define default values and thus experiences a more comfortable service. Moreover the service provider may preconfigure certain parameters, which allows for an automated processing of the MMS service by the terminal. In the latter case the user does not have to set these parameters manually, which again increases the comfort.

[0074] Table 8 shows the preferred structure of every single record (an entry) of the elementary file.

Identifier: '6FD3'	Structure: Linear fixed	Optional	
Record length: H+I+J+K+L+M+N+O+P+Q+R+13 bytes		Update activity: low	
Access Conditions:			
READ		PIN	
UPDATE		PIN	
DEACTIVATE		ADM	
ACTIVATE		ADM	
Bytes	Description	M/O	Length
1 to H	Alpha-Identifier	O	H bytes
H+1 to H+2	Parameter Indicators	M	2 bytes
H+3	MMS Implementation	M	1 byte
H+4	Length of the originator address	O	1 byte
H+5	Length of the recipient address	O	1 byte
H+6	Length of the MMS Relay/Server address	O	1 byte
H+7	Length of the expiry time	O	1 byte
H+8	Length of earliest time of delivery	O	1 byte
H+9	Length of the message class	O	1 byte
H+10	Length of Sender visibility request	O	1 byte
H+11	Length of Delivery report request	O	1 byte
H+12	Length of Read reply report request	O	1 byte
H+13	Length of Priority	O	1 byte
H+14 to H+I+13	Originator address	O	I bytes
H+I+14 to H+I+J+13	Recipient address	O	J bytes
H+I+J+14 to H+I+J+K+13	MMS Relay/Server address	O	K bytes
H+I+J+K+14 to	Expiry time	O	L bytes

	H+I+J+K+L+13			
5	H+I+J+K+L+14 to H+I+J+K+L+M+13	Earliest time of delivery	0	M bytes
	H+I+J+K+L+M+14 to H+I+J+K+L+M+N+13	Message class	0	N bytes
10	H+I+J+K+L+M+N+14 to H+I+J+K+L+M+N+O+13	Sender visibility request	0	O byte
15	H+I+J+K+L+M+N+O+14 to H+I+K+L+M+N+O+ P+13	Delivery report request	0	P byte
20	H+I+J+K+L+M+N+O+P+ 14 to H+I+J+K+L+M+N+O+ P+Q+13	Read reply report request	0	Q byte
25	H+I+J+K+L+M+N+O+P+Q +14 to H+I+J+K+L+M+N+O+P+Q +R+13	Priority	0	R byte
30				

Table 8: EF for MMS parameters.

[0075] According to Table 8, the EF_{MMSP} preferably comprises one or more of the following data:

1. Alpha-Identifier

[0076] Preferred contents: The alpha-identifier is an alpha Tag to the associated MMS-parameter. It can be defined by the USIM or the USIM application toolkit and if available it should be rendered to the user, i.e. it should be shown on the display.

[0077] Preferred coding: The alpha-identifier is coded as text string according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

2. Parameter Indicators

[0078] Preferred contents: The parameters indicators contain the information if the MMS related parameters are present or not - see figures 5 and 6.

[0079] Preferred coding: Allocation of bits:

Bit number	Parameter indicated
1	Length of originator address
2	Length of recipient address
3	Length of MMS Relay/Server address
4	Length of expiry time
5	Length of earliest time of delivery
6	Length of message class

(continued)

Bit number	Parameter indicated
7	Length of Sender visibility request
8	Length of Delivery report request
9	Length of Read reply report request
10	Length of Priority
11-16	Reserved for future use
Bit value Meaning	
0	Parameter present.
1	Parameter absent.

3. MMS Implementation

[0080] Preferred contents: The MMS Implementation contains the used protocol type, e.g. WAP, IP, etc. This information is used to indicate the MMS implementation type and version used for the MMS related information on the USIM and thus e.g. to ensure backwards compatibility.

Preferred coding: Allocation of bits:

Bit number	Parameter indicated
1	WAP implementation of MMS according to WAP-209-MMSEncapsulation, Version 17
2-8	Reserved for future use
Bit value Meaning	
0	Implementation not supported.
1	Implementation supported.

4. Length of the originator address

[0081] Preferred contents: The length of the originator address contains the length of the originator address.

[0082] Preferred coding: The Length of the originator address is coded in bytes.

5. Length of the recipient address

[0083] Preferred contents: The length of the recipient address contains the length of the recipient address.

[0084] Preferred coding: The length of the recipient address is coded in bytes.

6. Length of the MMS Relay/Server address

[0085] Preferred contents: The length of the MMS Relay/Server address contains the length of the address of the MMS Relay/Server.

[0086] Preferred coding: The length of the MMS Relay/Server address is coded in bytes.

7. Length of the expiry time

[0087] Preferred contents: The length of the expiry time contains the length of the expiry time.

[0088] Preferred coding: The length of the expiry time is coded in bytes.

8. Length of the earliest time of delivery

[0089] Preferred contents: The length of the earliest time of delivery contains the length of the earliest time of delivery.

[0090] Preferred coding: The length of the earliest time of delivery is coded in bytes.

9. Length of the message class

[0091] Preferred contents: The length of the message class contains the length of the message class.

[0092] Preferred coding: The length of the message class is coded in bytes.

10. Sender visibility request

[0093] Preferred contents: The sender visibility request contains the request if the address/phone number of the sender to the recipient is shown unless the sender has a secret number. This is used for user assistance in the MM composition.

[0094] Preferred coding: The sender visibility request is coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

11. Delivery report request

[0095] Preferred contents: The delivery report request contains the information if the delivery report is requested. This is used for user assistance in the MM composition.

[0096] Preferred coding: The delivery request is coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

12. Read reply report request

[0097] Preferred contents: The read reply report request contains the information if the read reply report is requested. This is used for user assistance in the MM composition.

[0098] Preferred coding: The read reply report is coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

13. Priority

[0099] Preferred contents: The priority contains the priority (importance) of the message. This is used for user assistance in the MM composition.

[0100] Preferred coding: The priority is coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

14. Originator address

[0101] Preferred contents: The originator address contains the address of the originator. This originator address can be an MSISDN (Mobile Subscriber Integrated Services Digital Network Number, an e-mail address or other operator specific addresses. This parameter can be used by the service provider to preconfigure the MMS service and it can be used for user assistance in the MM composition.

[0102] Preferred coding: The originator is coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

15. Recipient address

[0103] Preferred contents: The recipient address contains the address of the recipient. This recipient address can be an MSISDN (Mobile Subscriber Integrated Services Digital Network Number, an e-mail address or other operator specific addresses. This can be used for user assistance in the MM composition.

[0104] Preferred coding: The recipient is coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

16. MMS Relay/Server address

[0105] Preferred contents: The MMS Relay/Server address contains the address of the MMS Relay/Server. This parameter can be used by the service provider to preconfigure the MMS service. This address can be a configurable URI (Uniform Resource Identifier) and is given by the MMS Service Provider. It is necessary for the UA to know the address of the MMS Relay/Server, because the UA has to know where to submit MMs and MMS read-reply reports to.

[0106] Preferred coding: The MMS Relay/Server is coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

17. Expiry time

[0107] Preferred contents: The expiry time contains the length of the time that the message is available. This parameter can be used by the service provider to preconfigure the MMS service and it can be used for user assistance in the MM composition.

[0108] Preferred coding: The expiry time is coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

18. Earliest time of delivery

[0109] Preferred contents: The earliest time of delivery is the earliest time that the message is delivered. This parameter can be used by the service provider to preconfigure the MMS service and it can be used for user assistance in the MM composition.

[0110] Preferred coding: The earliest time of delivery is coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

19. Message class

[0111] Preferred contents: The message class contains the class of the multimedia message. This message class can be for example personal, advertisement, information service, etc. This is used for user assistance in the MM composition.

[0112] Preferred coding: The message class is coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

[0113] In Figure 5 an example of this EF_{MMS} is shown to describe the functionality of the parameter indicators. The bit structure of the 2 bytes long "Parameter Indicators" of Fig. 5 is also shown in Figure 6.

[0114] In this example, bit 1, 2 and 3 of the parameter indicators equal "1", which means that the length of the 1st, 2nd and 3rd parameters - length of originator address, length of the recipient address and the length of the MMS Relay/Server address (and thus implicitly also the originator address, the recipient address and the MMS Relay/Server address) - are present. The other bitsequal "0", which means that all other parameters are absent.

e) EF_{MMSDR} (MMS delivery report)

[0115] This EF preferably comprises information in accordance with 3G TS 23.140 and WAP-209-MMSEncapsulation comprising multimedia message delivery reports which have been received by the UA from the MMS Relay/Server. For every delivery report corresponds to an MM this EF also refers to that associated MM.

[0116] Each record is preferably used to store the delivery report of a previously submitted MM in a record of EF_{MM}. The first byte of each record is preferably the link between the delivery report and the corresponding MM in EF_{MM}. Table 9 shows the preferred structure of every single record (an entry) of the elementary file.

Identifier: '6FD4'	Structure: Linear fixed	Optional	
Record length: 1+S bytes		Update activity: low	
Access Conditions:			
READ	PIN		
UPDATE	PIN		
DEACTIVATE	ADM		
ACTIVATE	ADM		
Bytes	Description	M/O	Length
1	MMS delivery record identifier	M	1
2 to S+1	MMS delivery report	M	S bytes

Table 9: EF for MMS delivery report.

[0117] According to Table 9, the EF_{MMSDR} preferably comprises one or more of the following data:

1. MMS delivery record identifier

[0118] Preferred contents: The MMS delivery record identifier identifies the corresponding MM record in EF_{MM}, e.g. if this byte is coded '05' then this delivery report corresponds to the MM in record #5 of EF_{MM}.

[0119] Preferred coding:

'00'	empty record.
'01' - 'FF'	record number of the corresponding MM in EF _{MM} .

2. MMS delivery report

[0120] Preferred contents: The MMS delivery report contains the MMS-DELIVERY-REPORT as specified in 3G TS 23.140 and WAP-209-MMSEncapsulation, preferably with identical coding and ordering of parameters.

[0121] Preferred coding: The MMS delivery report is coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

f) EF_{MMSRR} (MMS read reply report)

[0122] This EF preferably comprises information in accordance with 3G TS 23.140 and WAP-209-MMSEncapsulation comprising multimedia message read reply reports which have been received by the UA from the MMS Relay/Server or are to be used as an UA originated message. For every read-reply report corresponds to an MM this EF also refers to that associated MM.

[0123] Each record is preferably used to store the read reply report to an MM in a record of EF_{MM}. The first byte of each record is the link between the read reply report and the corresponding MM in EF_{MM}. Table 10 shows the preferred structure of every single record (an entry) of the elementary file.

Identifier: '6FD5'		Structure: Linear fixed		Optional
Record length: T+1 bytes			Update activity: low	
Access Conditions:				
READ		PIN		
UPDATE		PIN		
DEACTIVATE		ADM		
ACTIVATE		ADM		
Bytes	Description		M/O	Length
1	MMS read reply record identifier		M	1
2 to T+1	MMS read reply report		M	T bytes

Table 10: EF for MMS read reply report.

[0124] According to Table 10, the EF_{MMSRR} preferably comprises one or more of the following data:

1. MMS read reply record identifier

[0125] Preferred contents: The MMS read reply record identifier identifies the corresponding MM record in EF_{MM}, e.g. if this byte is coded '05' then this read reply report corresponds to the MM in record #5 of EF_{MM}.

[0126] Preferred coding:

'00'	empty record.
'01' - 'FF'	record number of the corresponding MM in EF _{MM} .

2. MMS read reply report

[0127] Preferred contents: The MMS read reply report contains the MMS-READ_REPLY-REPORT as specified in 3G TS 23.140 and WAP-209-MMSEncapsulation, preferably with identical coding and ordering of parameters.

[0128] Preferred coding: The MMS read reply report is coded according to 3G TS 23.140 and WAP-209-MMSEncapsulation.

g) EF_{MMSL} (MMS size limitations)

[0129] This EF preferably comprises values for Multimedia Messaging Service header limitations, which can be defined by the authority that owns the USIM/UICC (in general the network operator).

[0130] For the USIM only supports a linear fixed file structure (see explanations above), the authority that owns the USIM/UICC needs to define a maximum length of each record (of every file). MMS-related information, however, is not limited to a certain size. Thus, there are no MMS-inherent pre-settings for the maximum length of MMS-related records.

[0131] This invention thus proposes an EF_{MMSL} wherein the authority that owns the USIM/UICC defines the maximum length of MMS-related records in a manner appropriate to this authorities needs. This EF can be read by a terminal (where the USIM/UICC is plugged in to) upon booting the card in order to be informed of the authorities settings. According to these settings the terminal then has to cut MMS-related information in case these exceed the limitations.

[0132] Table 11 shows the preferred structure of every single record (an entry) of the elementary file EF_{MMSL}.

Identifier: '6FD6'	Structure: Linear fixed	Optional	
Record length: 14 bytes		Update activity: low	
Access Conditions:			
READ		PIN	
UPDATE		PIN	
DEACTIVATE		ADM	
ACTIVATE		ADM	
Bytes	Description	M/O	Length
1 to 2	Length of a record in EF _{MMSN}	0	2 bytes
3 to 6	Length of a record in EF _{MM}	0	4 bytes
7 to 8	Length of a record in EF _{MMSS}	0	2 bytes
9 to 10	Length of a record in EF _{MMSP}	0	2 bytes
11 to 12	Length of a record in EF _{MMSDR}	0	2 bytes
13 to 14	Length of a record in EF _{MMSRR}	0	2 bytes

Table 11: EF for MMS limitations.

[0133] According to Table 11, the EF_{MMSL} preferably comprises one or more of the following data:

1. Length of a record in EF_{MMSN} (MMS notification)

[0134] Preferred contents/preferred coding: Defines the length of a record in EF_{MMSN}, i.e. the maximum size of an MMS notification that can be stored on the USIM, which is 1+A (see above), in bytes. For the length of a record in

EF_{MMSN} is encoded as a 2 byte number, the maximum possible value is 64 kbyte.

2. Length of a record in EF_{MM} (Multimedia Message)

- 5 **[0135]** Preferred contents/preferred coding: Defines the length of a record in EF_{MM}, i.e. the maximum size of a Multimedia Message that can be stored on the USIM, which is 1+B (see above), in bytes. For the length of a record in EF_{MMSN} is encoded as a 4 byte number, the maximum possible value is 4 Giga-Byte.

3. Length of a record in EF_{MMSS} (MMS status)

- 10 **[0136]** Preferred contents/preferred coding: Defines the length of a record in EF_{MMSS}, i.e. the maximum size of an MMS status entry that can be stored on the USIM, which is C+D+E+F+G (see above), in bytes. For the length of a record in EF_{MMSS} is encoded as a 2 byte number, the maximum possible value is 64 kbyte.

15 4. Length of a record in EF_{MMSS} (MMS status)

- [0137]** Preferred contents/preferred coding: Defines the length of a record in EF_{MMSS}, i.e. the maximum size of an MMS status entry that can be stored on the USIM, which is C+D+E+F+G (see above), in bytes. For the length of a record in EF_{MMSS} is encoded as a 2 byte number, the maximum possible value is 64 kbyte.

20 5. Length of a record in EF_{MMSP} (MMS parameter)

- [0138]** Preferred contents/preferred coding: Defines the length of a record in EF_{MMSP}, i.e. the maximum size of an MMS parameter entry that can be stored on the USIM, which is H+I+J+K+L+M+N+O+P+Q+R+13 (see above), in bytes. For the length of a record in EF_{MMSP} is encoded as a 2 byte number, the maximum possible value is 64 kbyte.

6. Length of a record in EF_{MMSDR} (MMS delivery report)

- 30 **[0139]** Preferred contents/preferred coding: Defines the length of a record in EF_{MMSDR}, i.e. the maximum size of an MMS delivery report that can be stored on the USIM, which is 1+S (see above), in bytes. For the length of a record in EF_{MMSDR} is encoded as a 2 byte number, the maximum possible value is 64 kbyte.

7. Length of a record in EF_{MMSRR} (MMS read-reply report)

- 35 **[0140]** Preferred contents/preferred coding: Defines the length of a record in EF_{MMSRR}, i.e. the maximum size of an MMS read-reply report that can be stored on the USIM, which is 1+T (see above), in bytes. For the length of a record in EF_{MMSRR} is encoded as a 2 byte number, the maximum possible value is 64 kbyte.

h) EF_{UST} (USIM Service Table)

- 40 **[0141]** This EF indicates to a UE which services are available in a USIM. If a service is not indicated as available in the USIM, the UE shall not select this service. From the USIM Service Table a UE can immediately retrieve the information whether or not a USIM supports the MMS service.

45 **[0142]** Table 12 shows the preferred structure of every single record (an entry) of the elementary file.

Identifier: '6F38'	Structure: transparent	Mandatory	
SFI: '04'			
File size: X bytes, X >= 1	Update activity: low		
Access Conditions:			
READ	PIN		
UPDATE	ADM		
DEACTIVATE	ADM		
ACTIVATE	ADM		
Bytes	Description	M/O	Length
1	Services n°1 to n°8	M	1 byte
2	Services n°9 to n°16	O	1 byte
3	Services n°17 to n°24	O	1 byte
4	Services n°25 to n°32	O	1 byte
etc.			
X	Services n°(8X-7) to n°(8X)	O	1 byte

Table 12: EF for the USIM service table.

[0143] The Services n°1 to n°50 may have the content as listed in Table 13. Here, the Services n°44 to n°50 refer to MMS-related information of which one or more preferably are included in said elementary file according to the invention.

Table 13:

Preferred services of the USIM service table.		
Services contents	Service n°	
	Service n°1	Local Phone Book
	Service n°2	Fixed Dialing Numbers (FDN)
	Service n°3	Extension 2
	Service n°4	Service Dialing Numbers (SDN)
	Service n°5	Extension3
	Service n°6	Barred Dialing Numbers (BDN)
	Service n°7	Extension4
	Service n°8	Outgoing Call Information (OCI and OCT)
	Service n°9	Incoming Call Information (ICI and ICT)
	Service n°10	Short Message Storage (SMS)
	Service n°11	Short Message Status Reports (SMSR)
	Service n°12	Short Message Service Parameters (SMSP)
	Service n°13	Advice of Charge (AoC)
	Service n°14	Capability Configuration Parameters (CCP)
	Service n°15	Cell Broadcast Message Identifier
	Service n°16	Cell Broadcast Message Identifier Ranges
	Service n°17	Group Identifier Level 1
	Service n°18	Group Identifier Level 2
	Service n°19	Service Provider Name
	Service n°20	User controlled PLMN selector with Access Technology

Table 13: (continued)

Preferred services of the USIM service table.		
	Service n°21	MSISDN
5	Service n°22	Image (IMG)
	Service n°23	Not used (reserved for SoLSA)
	Service n°24	Enhanced Multi-Level Precedence and Pre-emption Service
	Service n°25	Automatic Answer for Empp
10	Service n°26	RFU
	Service n°27	GSM Access
	Service n°28	Data download via SMS-PP
	Service n°29	Data download via SMS-CB
	Service n°30	Call Control by USIM
15	Service n°31	MO-SMS Control by USIM
	Service n°32	RUN AT COMMAND command
	Service n°33	Packet Switched Domain
	Service n°34	Enabled Services Table
	Service n°35	APN Control List (ACL)
20	Service n°36	Depersonalization Control Keys
	Service n°37	Co-operative Network List
	Service n°38	GSM security context
	Service n°39	CPBCH Information
25	Service n°40	Investigation Scan
	Service n°41	MexE
	Service n°42	Operator controlled PLMN selector with Access Technology
	Service n°43	HPLMN selector with Access Technology
30	Service n° 44	Multimedia Message Notification
	Service n° 45	Multimedia Message Service Storage
	Service n° 46	Multimedia Message Service Delivery Report
	Service n° 47	Multimedia Message Read Reply Report
	Service n° 48	Multimedia Message Parameters
35	Service n° 49	Multimedia Message Service Status
	Service n° 50	Multimedia Message Service Limitations

[0144] The EF shall contain at least one byte. Further bytes may be included, but if the EF includes an optional byte, then it is mandatory for the EF to also contain all bytes before that byte. Other services are possible in the future and will be coded on further bytes in the EF.

[0145] Preferred coding:

[0146] 1 bit is used to code each service:

bit = 1: service available;

bit = 0: service not available.

[0147] Service available means that the USIM has the capability to support the service and that the service is available for the user of the USIM unless the service is identified as "disabled" in EF_{EST}, another elementary file on the USIM.

[0148] Service not available means that the service shall not be used by the USIM user, even if the USIM has the capability to support the service.

[0149] The preferred coding of each byte in EF_{UST} is shown in Tables 14 and 15.

First byte:

[0150]

5

10

15

20

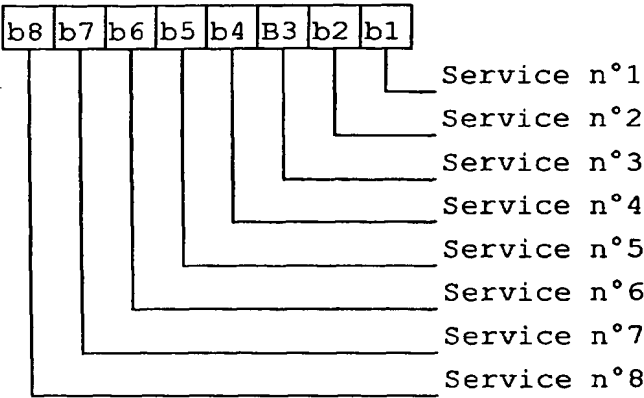


Table 14: Preferred coding of the first byte of the USIM service table.

25

Second byte:

[0151]

30

35

40

45

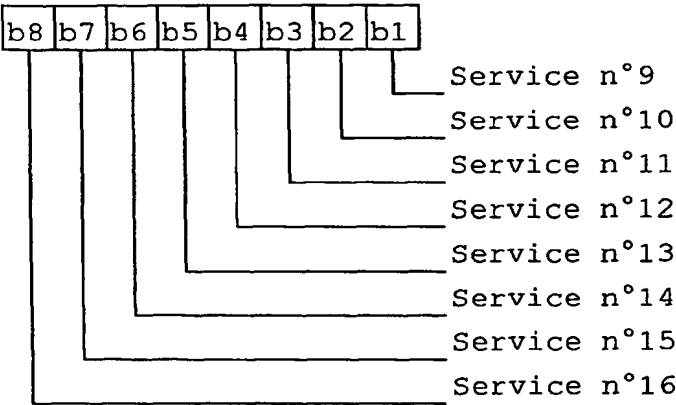


Table 15: Preferred coding of the second byte of the USIM service table.

50

etc.

55

With regard to the Services n°44 to n°50 of Table 13:

[0152] The Parameter **"Multimedia Message Notification"** indicates whether EF_{MMSN} is supported on the USIM.

[0153] The Parameter **"Multimedia Message Service Storage"** indicates whether EF_{MM} is supported on the USIM.

[0154] The Parameter "**Multimedia Message Service Delivery Report**" indicates whether EF_{MMSDR} is supported on the USIM.

[0155] The Parameter "**Multimedia Message Read Reply Report**" indicates whether EF_{MMSRR} is supported on the USIM.

[0156] The Parameter "**Multimedia Message Parameters**" indicates whether EF_{MMSP} is supported on the USIM.

[0157] The Parameter "**Multimedia Message Service Status**" indicates whether EF_{MMSS} is supported on the USIM.

[0158] The Parameter "**Multimedia Message Service Limitations**" indicates whether EF_{MMSL} is supported on the USIM.

[0159] Figure 7 shows an example how storage of MMS related information on the USIM can be achieved according to this first preferred mechanism described above. The elementary files proposed above that contain MMS-related information are marked as bold boxes.

II. Storage of MMS related information in one universal file

[0160] The second preferred embodiment is the storage of MMS-related information in one universal/generic file dedicated to MMS. All the MMS related information preferably will be saved in one universal/generic file. The advantage of using one universal/generic file is the optimization of the used memory. Table 16 shows the preferred structure of every single record (an entry) of the elementary file EF_{MMS}.

Identifier: '6FD5'	Structure: Linear fixed	Optional	
Record length: U+2 bytes		Update activity: low	
Access Conditions:			
READ	PIN		
UPDATE	PIN		
DEACTIVATE	ADM		
ACTIVATE	ADM		
Bytes	Description	M/O	Length
1	Status	M	1 byte
2	Message type	M	1 byte
3 to U+2	Message	M	U bytes

Table 16: Universal EF for MMS related information.

[0161] According to Table 16, the EF_{MMS} preferably contains one or more of the following data:

1. Status

[0162] The preferred contents and preferred coding of the Status is according to the example of the EF_{MMSN}.

2. Message type

[0163] Preferred contents: The message type contains the information which message type is used. Possible message types are shown - together with their preferred encoding - in Table 17.

[0164] Preferred coding:

b8	b7	b6	b5	b4	b3	b2	b1	
				X	X	X	0	Free space
				X	X	X	1	Used space
				0	0	0	1	MMS notification
				0	0	1	1	MM
				0	1	0	1	Delivery report
				0	1	1	1	Read reply report
								Reserved for future

Table 17: Preferred coding of the message type.

3. Message

[0165] Preferred contents: The message content is the information of the selected message type according to the description of that message type in example I.

[0166] Preferred coding: The coding of the selected message type is in accordance to the description of that message type described in example I.

[0167] For this second proposal it is seen valuable to have EF_{UST}, EF_{MMSP} and EF_{MMSS} in addition to EF_{MMS} as in the first proposal.

III. Storage of the MMS notification in EF_{SMS}

[0168] The third preferred embodiment is the storage of the MMS notification in EF_{SMS}, an elementary file used for the storage of short messages (SMS). At least in the early beginnings of MMS, notifications will be sent encapsulated in a short message. This is why MMS notifications can be stored in EF_{SMS}.

[0169] The advantage of this proposal is that the existing file structure of the USIM can be used unchanged. The disadvantage is that other important MMS related information can not be stored.

[0170] The elementary file EF_{SMS} (Short messages) preferably contains information in accordance with 3G TS 31.101 (3GPP TS 31.101 V3.3.0, UICC-Terminal Interface; Physical and Logical Characteristics) comprising short messages (and associated parameters) which have either been received by the UE from the network, or are to be used as an UE originated message. Table 18 shows the preferred structure of every single record (an entry) of the elementary file.

Identifier: '6F3C'	Structure: linear fixed	Optional	
Record length: 176 bytes	Update activity: low		
Access Conditions:			
READ	PIN		
UPDATE	PIN		
DEACTIVATE	ADM		
ACTIVATE	ADM		
Bytes	Description	M/O	Length
1	Status	M	1 byte
2 to 176	Remainder	M	175 bytes

Table 18: EF for SMS.

[0171] The EF_{SMS} preferably contains one or more of the following data:

1. Status

[0172] Preferred contents: The Status byte of the record can be used as a pattern in the SEARCH RECORD command. For UE (User Equipment) originating messages sent to the network, the status preferably shall be updated when the UE receives a status report, or sends a successful SMS Command relating to the status report.

[0173] Preferred coding:

b8	b7	b6	b5	b4	b3	b2	b1	
				x	X	X	0	free space
				X	X	X	1	used space
				0	0	0	1	Message received by UE from network; message read
				0	0	1	1	Message received by UE from network; message to be read
				0	1	1	1	UE originating message; message to be sent
				1	0	0	1	MMS notification Reserved for future (see 3G TS 31.101 [11])

b8	b7	b6	b5	b4	b3	b2	b1	
				X	X	1	0	1 UE originating message; message sent to the network:
				0	0	1	0	1 Status report not requested
				0	1	1	0	1 Status report requested, but not (yet) received;
				1	0	1	0	1 Status report requested, received, but not stored in EF-SMSR;
				1	1	1	0	1 Status report requested, received and stored in EF-SMSR;
								RFU (see 3G TS 31.101 [11])

Table 19: Preferred coding for the status byte.

2. Remainder

[0174] The Remainder is proposed to be as in 3G TS 31.101. I.e. if a UE receives an MMS notification from the network - as long as this notification is carried in a short message (SMS) - the notification can be stored in EF_{SMS} with a status byte equal to "0000 1001" in binary presentation, which is "09" in hexadecimal presentation. For this third proposal it is seen valuable to have EF_{UST}, EF_{MMSP} and EF_{MMSS} in addition to EF_{SMS} as in the first proposal.

[0175] In summary, important aspects of the present invention are:

[0176] Storage/Accessing of MMS related information or parts of MMS-related information on media different from the user's terminal, especially:

- on a SIM or on a USIM on a UICC;
- on a WIM
- on a smart card which is not one of the above, especially an MMC (Multimedia Card);
- a combination of these storage possibilities.

[0177] The following information preferably are stored on such a repository:

- MMS notifications;

- entire or parts of a Multimedia Message (MM);
- MMS delivery reports;
- MMS read-reply reports;
- MMS parameters;
- 5 - MMS status information;
- MMS limitations information (defined by the authority that owns the smart card);
- an indication of the smart card supporting MMS (e.g. in the USIM service table).

[0178] Three different mechanisms are preferred of how to achieve the storage of MMS-related information and how to access stored MMS-related information on a smart card, in particular on a SIM or a USIM on a UICC.:

- storage of MMS related information in several elementary files;
- storage of MMS related information in one universal elementary file;
- storage of the MMS notification in the existing elementary file EF_{SMS}.

Claims

1. Method for storing MMS (Multimedia Messaging Service)-related information, **characterized in that** said information is stored on at least one storage medium or a combination of storage mediums connected to a mobile communication apparatus which supports MMS services or a device connected to such a mobile communication apparatus, said at least one storage medium or a combination of storage mediums being disconnectable from said apparatus or said device.
2. Method for accessing MMS-related information by an apparatus adapted to process said MMS-related information, **characterized in that** said information is accessed on at least one storage medium or a combination of storage mediums connected to said apparatus, said at least one storage medium or a combination of storage mediums being disconnectable from said apparatus.
3. Method according to claim 1 or 2 **characterized in that** the MMS-related information is terminal-originated or terminal-terminated.
4. Method according to any one of the preceding claims **characterized in that** said at least one storage medium is a smart card, especially a SIM (Subscriber Identity Module), a USIM (UMTS Subscriber Identity Module) on a UICC (Universal Integrated Circuit Card), a WIM (Wireless application protocol Identity Module) or an MMC (Multimedia Card).
5. Method according to any one of the preceding claims **characterized in that** one or more of the following MMS-related information are stored and/or accessed on said at least one storage medium:
 - MMS notifications;
 - Entire Multimedia Messages (MM) or parts thereof;
 - MMS status information;
 - MMS delivery reports;
 - MMS read-reply reports;
 - MMS parameters;
 - MMS limitations information, especially those being defined by the authority that owns the smart card;
 - Indication of the MMS-services being available.
6. Method according to any one of the preceding claims **characterized in that** said information is stored and/or accessed in one or more files on said at least one storage medium, especially with these above files being one or more elementary files and/or dedicated files and/or the master file.
7. Method according to any one of the preceding claims **characterized in that** the files are of transparent, linear fixed, linear variable or linear cyclic file structure.
8. Method according to claim 6 or 7 **characterized in that** the information according to claim 5 each is stored and/or accessed in separate files (EF_{MMSN}, EF_{MM}, EF_{MMSS}, EF_{MMSP}, EF_{MMSDR}, EF_{MMSRR}, EF_{MMSL}, EF_{UST}) on said

at least one storage medium.

9. Method according to claim 8 **characterized in that** said one or more files (EF_{MMSN}, EF_{MM}, EF_{MMSS}, EF_{MMSP}, EF_{MMSDR}, EF_{MMSRR}, EF_{MMSL}, EF_{UST}) either already exist or are added to the file structure of said at least one storage medium.
10. Method according to claim 8 or 9 **characterized in that** a status byte is included in records of a file (EF_{MMSN}) which comprises at least one MMS notification wherein the status byte comprises information regarding the status of the MMS notification message, the delivery report and/or the MM retrieval.
11. Method according to claim 8 or 9 **characterized in that** a status byte is included in records of a file (EF_{MM}) which comprises at least one Multimedia Message (MM) wherein the status byte comprises information regarding the receipt of a MM, the reading status of a MM, the origin of a MM, the submission of a MM, the delivery report and/or the read-reply report.
12. Method according to claim 10 or 11 **characterized in that** the status byte is used as a pattern in the SEARCH RECORD command being a function on the interface between the terminal of said apparatus or said device and said at least one storage medium.
13. Method according to any one of claims 10 to 12 **characterized in that** the status byte is updated when said at least one storage medium is connected to an User Agent (UA) and said User Agent receives an MMS notification, receives an MM, receives an MMS delivery report and/or receives an MMS read-reply report or originates an MM, allows/disallows the creation of an MMS delivery report and/or originates an MMS read-reply report to be stored on said at least one storage medium.
14. Method according to any one of the preceding claims **characterized in that** one or more of the following information are included and/or accessed in the records of a file (EF_{MMSS}) which relates to MMS-related status information:
 - a unique reference assigned to the MM (Message-ID);
 - available memory for MMS-notifications (MMS notification memory capacity);
 - available memory for MMs (MM memory capacity);
 - available memory for delivery reports (MMS delivery report memory);
 - available memory for read reply reports (MMS read reply report memory capacity).
15. Method according to any one of the preceding claims **characterized in that** one or more of the following information are included and/or accessed in the records of a file (EF_{MMSP}) which relates to MMS-related values for Multimedia Messaging Parameters:
 - alpha Tag associated to the MMS-parameter (Alpha-Identifier) ;
 - Parameter Indicators which indicate the presence of MMS related parameters;
 - MMS Implementation which indicate the used protocol;
 - Length of the originator address;
 - Length of the recipient address;
 - Length of the MMS Relay/Server address;
 - Length of the expiry time;
 - Length of earliest time of delivery;
 - Length of the message class;
 - Length of Sender visibility request;
 - Length of Delivery report request;
 - Length of Read reply report request;
 - Length of Priority of message;
 - Originator address;
 - Recipient address;
 - MMS Relay/Server address;
 - Expiry time of message;
 - Earliest time of delivery of message;
 - Message class;
 - Sender visibility request;

- Delivery report request;
- Read reply report request;
- Priority of message.

- 5 **16.** Method according to any one of the preceding claims **characterized in that** one or more of the following information are included and/or accessed in the records of a file (EF_{MMSDR}) which relates to multimedia message delivery reports:
- 10
 - MMS delivery report identifier identifying the corresponding MM record in the elementary file EF_{MM};
 - MMS delivery report containing the MMS-DELIVERY-RECORD.
- 15 **17.** Method according to any one of the preceding claims **characterized in that** one or more of the following information are included in the records of a file (EF_{MMSRR}) which relates to multimedia-message read reply reports:
- 20
 - MMS read reply record identifier identifying the corresponding MM record in the elementary file EF_{MM};
 - MMS read reply containing the MMS-READ-REPLY-RECORD.
- 25 **18.** Method according to any one of the preceding claims **characterized in that** one or more of the following information are included and/or accessed in the records of a file (EF_{MMSL}) which comprises values for MMS record size limitations, preferably defined by the authority owning said at least one storage medium:
- 30
 - Length of a record in EF_{MMSN};
 - Length of a record in EF_{MM};
 - Length of a record in EF_{MMS};
 - Length of a record in EF_{MMSR};
 - Length of a record in EF_{MMSDR};
 - Length of a record in EF_{MMSRR}.
- 35 **19.** Method according to any one of the preceding claims **characterized in that** one or more MMS-services are added to the records of the elementary file EF_{UST} (USIM Service Table), e.g. Multimedia Message Notification, Multimedia Message Service Storage, Multimedia Message Service Delivery Report, Multimedia Message Read Reply Report, Multimedia Message Parameters, Multimedia Message Service Status, Multimedia Message Service Limitations.
- 40 **20.** Method according to any one of the preceding claims **characterized in that** one or more of the following information are stored and/or accessed in one generic elementary file (EF_{MMS}) :
- 45
 - Status of the Multimedia Message (received, originated, submitted);
 - Message type;
 - Message content.
- 50 **21.** Method according to any one of the preceding claims **characterized in that** MMS notification messages are stored and/or accessed in the elementary file EF_{SMS} containing information which comprise mobile terminated or mobile originated short messages.
- 55 **22.** Method according to claim 21 **characterized in that** a status byte is included in the records of said elementary file (EF_{SMS}) said status byte comprising information regarding the MMS notification.
- 23.** Method according to claim 22 **characterized in that** the status byte is used as a pattern in the SEARCH RECORD command being a function on the interface between the terminal of said apparatus or said device and said at least one storage medium.
- 24.** Storage medium for storing and/or allowing access to MMS-related information, especially information stored according to any one of the preceding claims, for use in an apparatus, said apparatus comprising means for processing said MMS-information, **characterized in that** said storage medium is designed such that it can be connected to and disconnected from said apparatus.
- 25.** Storage medium according to claim 24 that it is a smart card.

26. Storage medium according to claim 25 that it is a SIM (Subscriber Identity Module).

27. Storage medium according to claim 25 that it is a USIM (UMTS Subscriber Identity Module) on a UICC (Universal Integrated Circuit Card).

28. Storage medium according to claim 25 that it is a WIM (WAP Wireless Identity Module).

29. Storage medium according to claim 25 that it is a MMC (Multimedia Card).

30. Storage medium according to any one of claims 24 to 29 **characterized in that** one or more of the following MMS-related information are storable and/or accessible on said storage medium:

- MMS notifications;
- Entire Multimedia Messages (MM) or parts thereof;
- MMS delivery reports;
- MMS read-reply reports;
- MMS parameters;
- MMS status information;
- MMS limitations information defined by the authority that owns the smart card;
- Indication of the MMS-services being available.

31. Storage medium according to any one of claims 24 to 30 **characterized in that** said MMS-related information is storable and/or accessible in several elementary files (EF_{MMSN}, EF_{MM}, EF_{MMSS}, EF_{MMSP}, EF_{MMSDR}, EF_{MMSRR}, EF_{MMSL}, EF_{UST}) and/or dedicated files and/or the master file.

32. Storage medium according to any one of claims 24 to 30 **characterized in that** said MMS-related information is storable and/or accessible in one universal (generic) elementary file (EF_{MMS}).

33. Storage medium according to any one of claims 24 to 30 **characterized in that** said MMS-related information is storable and/or accessible in the elementary file EF_{SMS}.

34. Apparatus comprising means for storing and/or accessing MMS-related information according to any one of the steps of the claims 1 to 23 on a storage medium according to any one of the claims 24 to 33.

35. Apparatus according to claim 34 **characterized in that** it is a mobile communication apparatus, especially a mobile phone.

36. Apparatus according to claim 34 **characterized in that** it is an external device connectable to a mobile communication apparatus, especially a notebook, a laptop or an electronic organizer.

37. A software program comprising program code means wherein said software program may be run on an apparatus, especially an apparatus according to any one of claims 34 to 36, such that said software program together with said apparatus performs all the steps of any one of the claims 1 to 23.

38. A software program comprising program code means which is loadable on an apparatus, especially an apparatus according to any one of claim 34 to 36, such that said programmed apparatus is adapted to perform all the steps of any one of the claims 1 to 23.

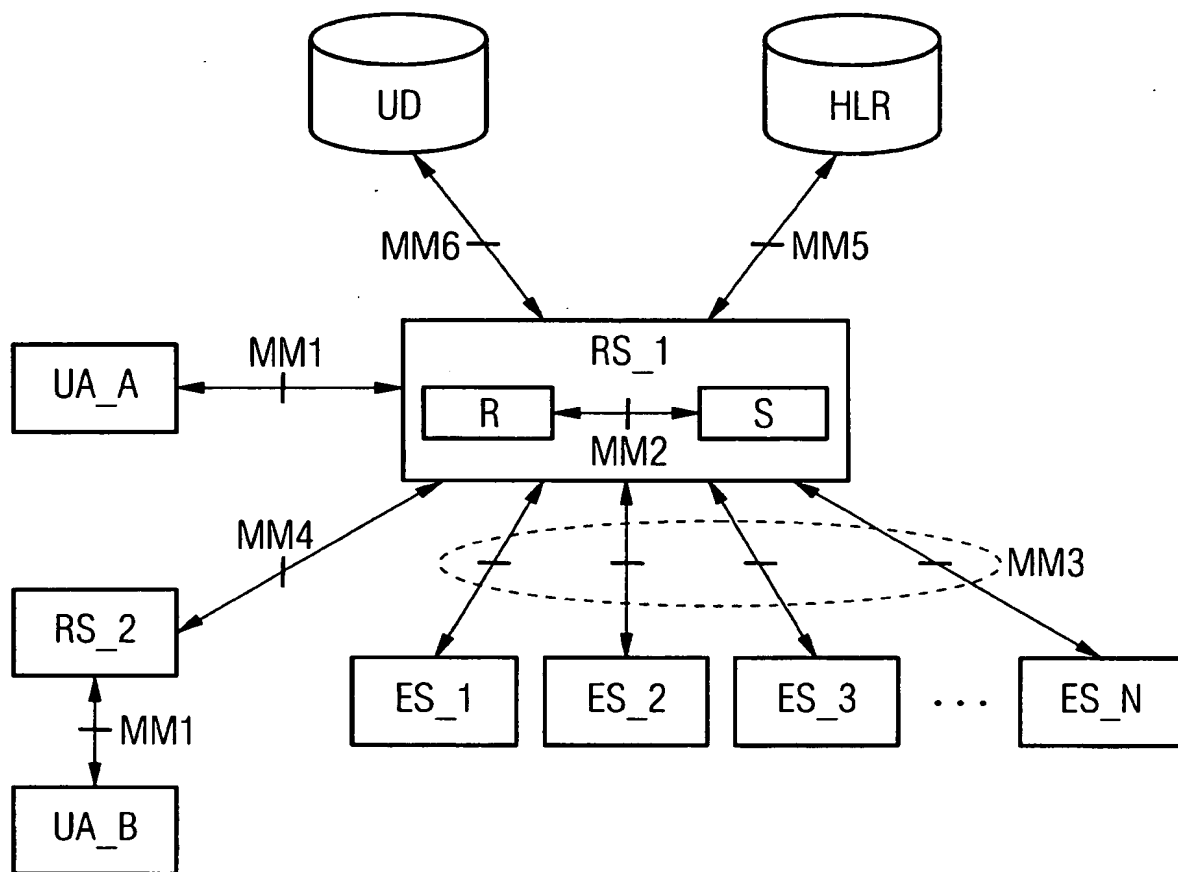
FIG 1 (State of the Art)

FIG 2 (State of the Art)

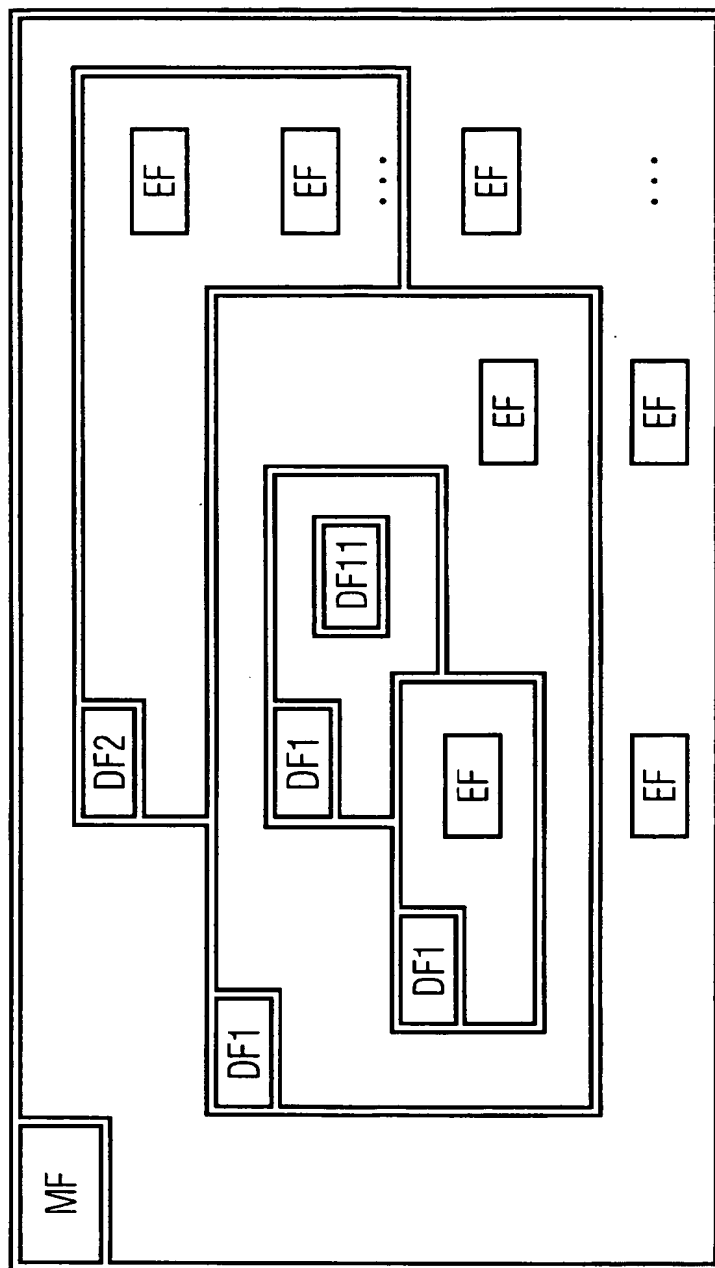


FIG 3A

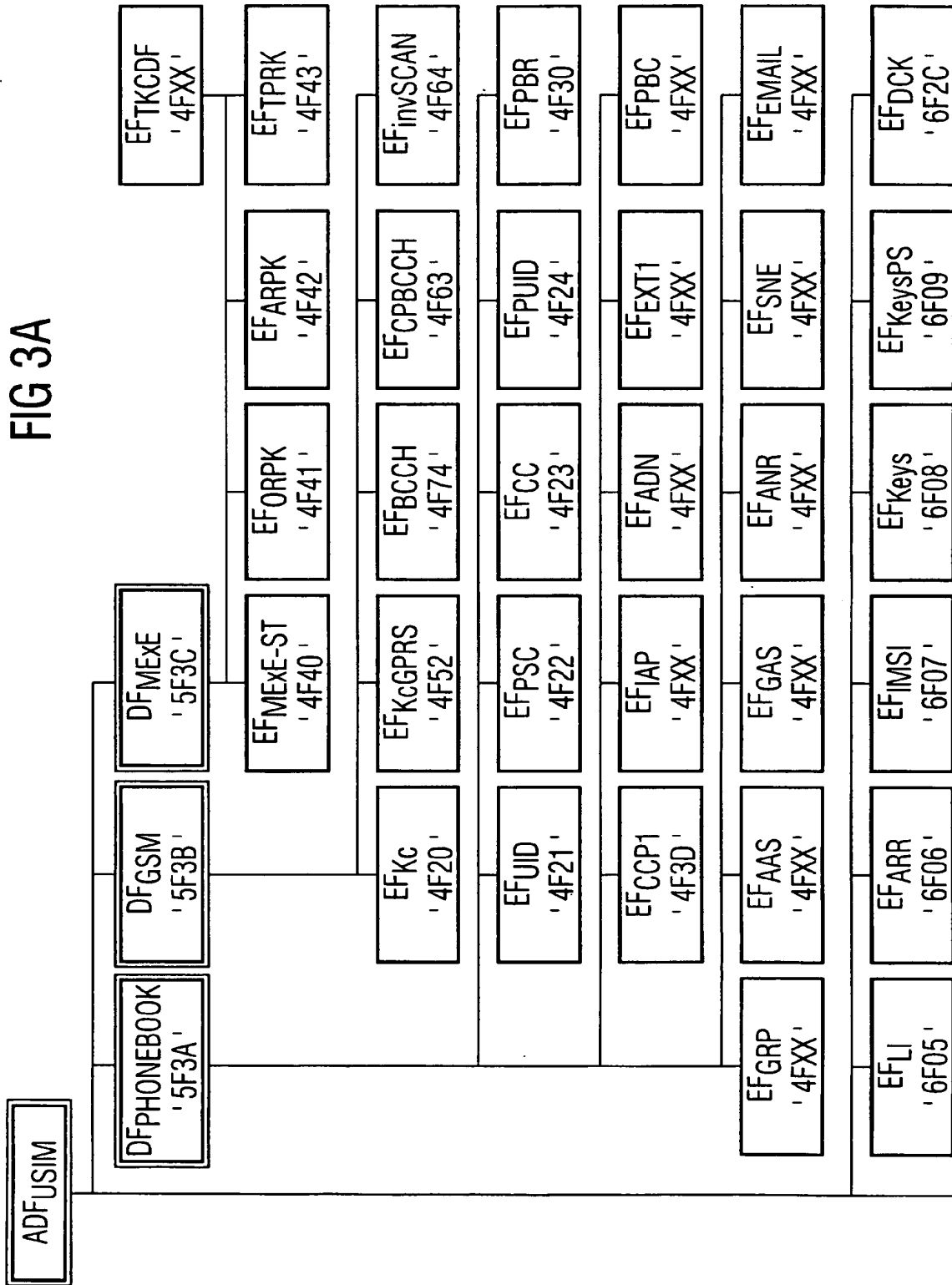
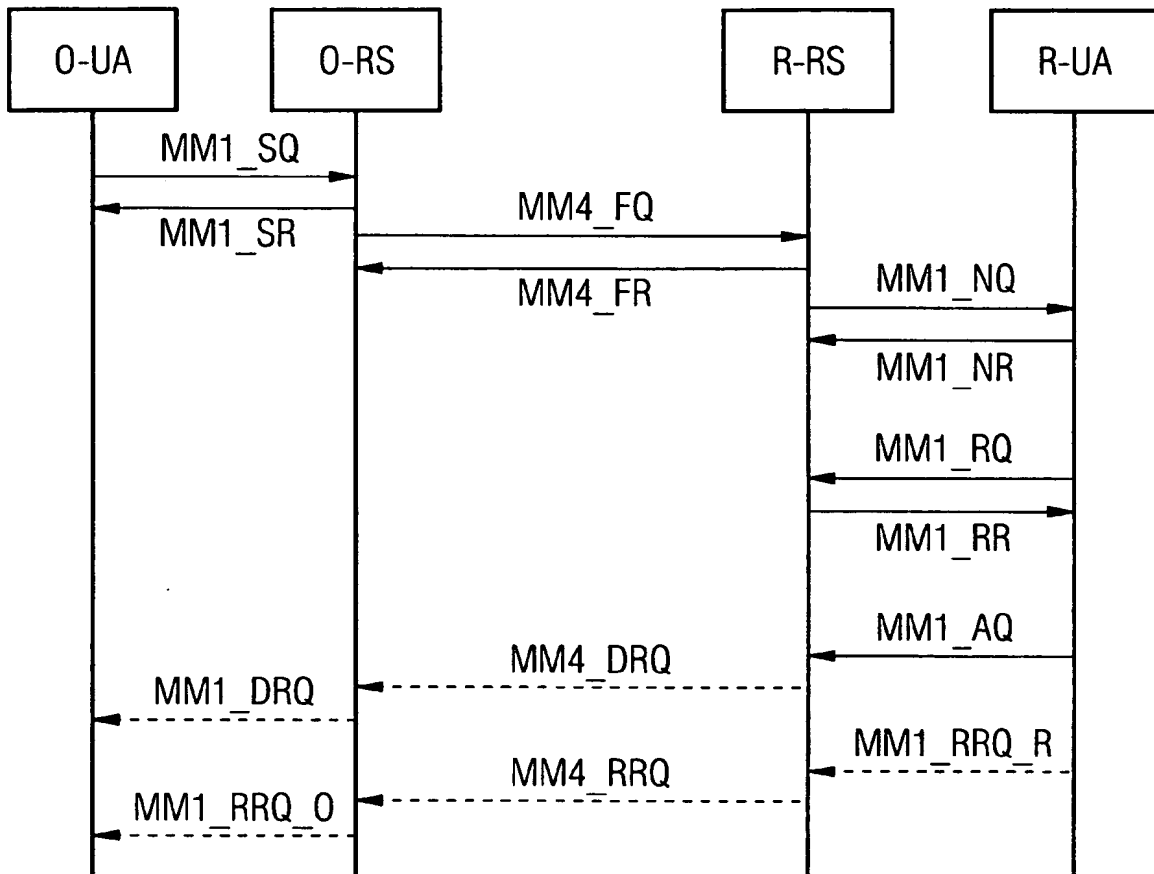


FIG 3B

EFHPLMN '6F31'	EF CNL '6F32'	EFACMmax '6F37'	EFUST '6F38'	EFACM '6F39'	EFFDN '6F3B'
EF SMS '6F3C'	EF GID1 '6F3E'	EF GID2 '6F3F'	EFMSISDN '6F40'	EFPUCT '6F41'	EF SMS P '6F42'
EF SMSS '6F43'	EF CBMI '6F45'	EF SPN '6F46'	EF SMS R '6F47'	EF CB MID '6F48'	EF SDN '6F49'
EF EXT2 '6F4B'	EF EXT3 '6F4C'	EF BDN '6F4D'	EF EXT5 '6F4E'	EF CB MIR '6F50'	EF EXT4 '6F55'
EF EST '6F56'	EF ACL '6F57'	EF CMI '6F58'	EF START-HFN '6F5B'	EF THRESHOLD '6F5C'	EF PLMNwAct '6F60'
EF OPLMNwAct '6F61'	EF HPLMNwAct '6F62'	EF RPLMNwAct '6F65'	EF LOC IPS '6F73'	EF ACC '6F78'	EF FPLMN '6F7B'
EF LOC I '6F7E'	EF ICI '6F80'	EF OCI '6F81'	EF ICT '6F82'	EF OCT '6F83'	EF AD '6FAD'
EF eMLPP '6FB5'	EF AaEM '6FB6'	EF ECC '6FB7'	EF Hiddenkey '6FC3'		

FIG 4 (State of the Art)

----- mandatory message

———— optional message

FIG 5

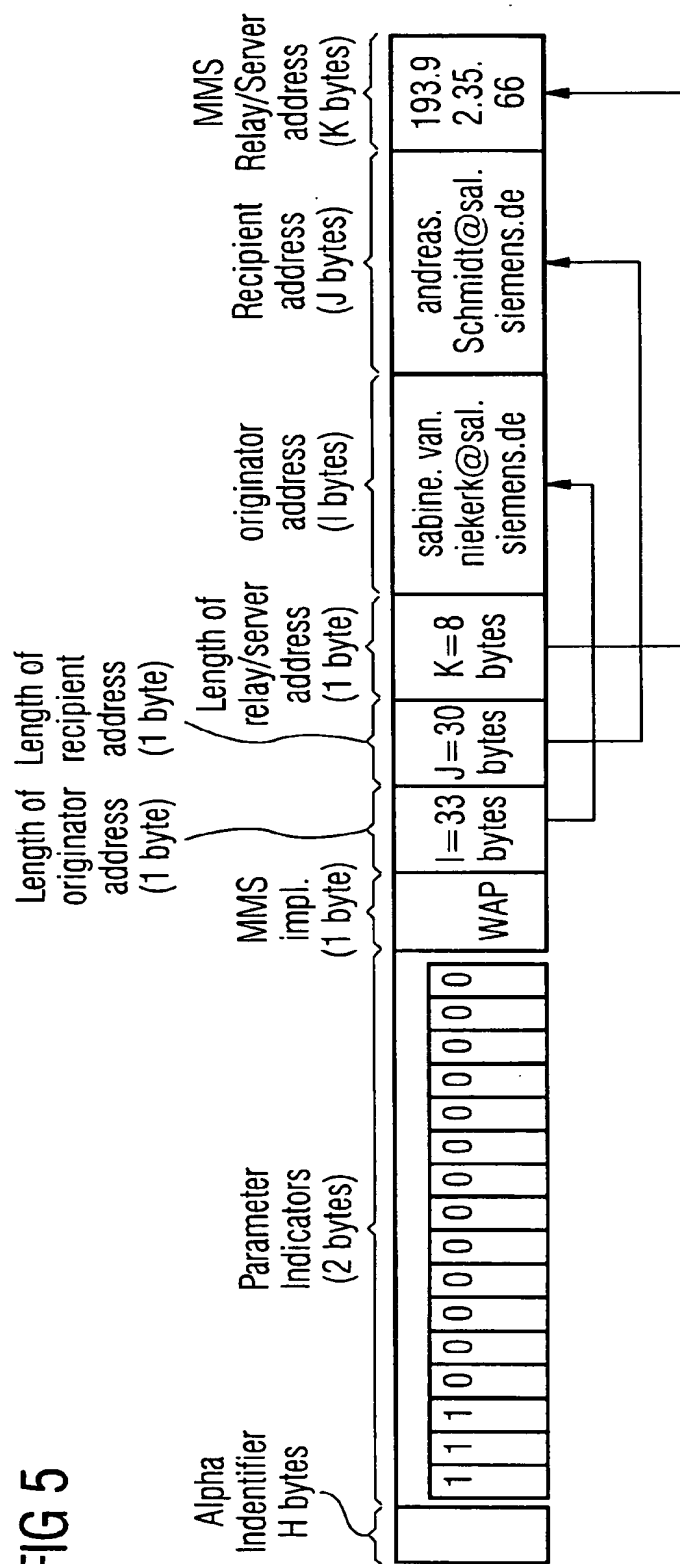
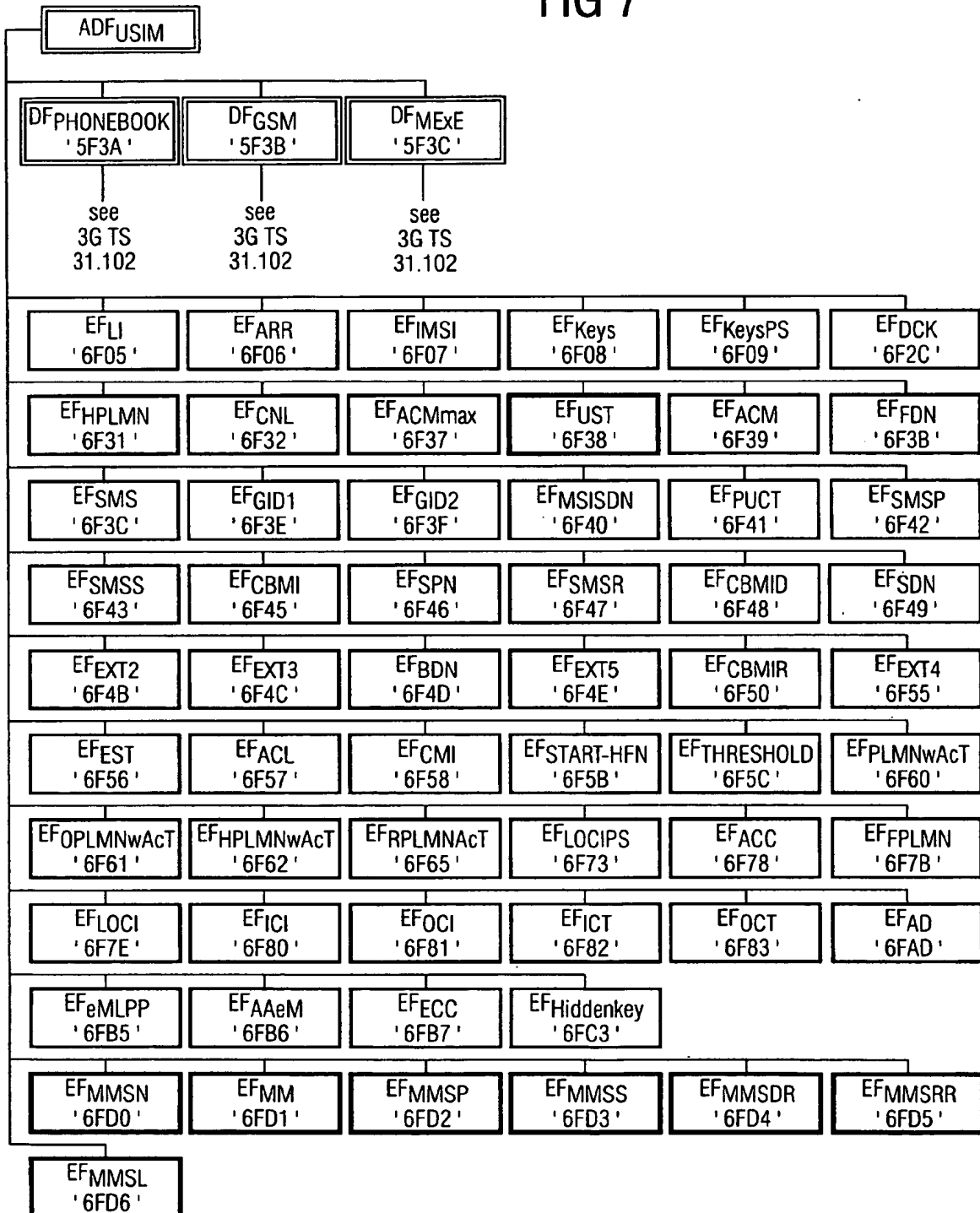


FIG 6

1	1	0	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0

FIG 7



Application Number

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 1 059 822 A (NOKIA MOBILE PHONES LTD) 13 December 2000 (2000-12-13) * page 1, line 6 - page 6, line 23 * * figures 1,3,4 *	1-4, 24-29	H04Q7/32 H04M3/533 H04L12/58
Y	---	5-23, 30-36	
Y	ETSI: "Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface (GSM 11.11 version 6.2.0 Release 1997)" TS 100977 V6.2.0, XX, XX, May 1999 (1999-05), XP002158150 * page 13, last paragraph - page 15, paragraph 9 * * page 21, paragraph 12 - page 103, last paragraph * ---	5-23, 30-36	
	---	-/-	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7) H04Q H04M H04L
INCOMPLETE SEARCH			
The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims.			
Claims searched completely : 1-36			
Claims searched incompletely :			
Claims not searched : 37-38			
Reason for the limitation of the search: Article 52 (2)(c) EPC - Program for computers			
Place of search	Date of completion of the search	Examiner	
MUNICH	16 November 2001	Nash, M	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, b.t published on, or after the filing date D : document cited in the application L : document cited for other reasons A : technological background O : non-written disclosure P : intermediate document S : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category			



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PARTIAL EUROPEAN SEARCH REPORT

Application Number
EP 01 11 0877

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	MAZZIOTTO G: "THE SUBSCRIBER IDENTITY MODULE FOR THE EUROPEAN DIGITAL CELLULAR SYSTEM GSM AND OTHER MOBILE COMMUNICATION SYSTEMS" PROCEEDINGS OF THE INTERNATIONAL SWITCHING SYMPOSIUM. YOKOHAMA, OCT. 25 - 30, 1992, TOKYO, IEICE, JP, vol. 1 SYMP. 14, 25 October 1992 (1992-10-25), pages 113-116, XP000337627 * the whole document *	1-3, 24, 25, 34-36	
A		4-23, 26-33	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)

EPO FORM 1503 03/82 (P04C16)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 11 0877

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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16-11-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1059822 A	13-12-2000	BR 0002069 A	02-01-2001
		CN 1276694 A	13-12-2000
		EP 1059822 A2	13-12-2000
		JP 2001016634 A	19-01-2001
<hr/>			

EPC FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82